

# Massachusetts State Trauma System



## Subcommittee Recommendations

Data Registry

Designation

Clinical

Injury Prevention/Public Education

Approved by the State Trauma Committee April 11, 2002

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# **Data Registry**

**The consensus of this Subcommittee is represented in the following recommendations:**

## **Objectives of Subcommittee**

The Data/Registry Subcommittee is responsible for advising the State Trauma Committee on trauma data necessary for establishing a statewide coordinated system of trauma care. This includes the reporting and analysis of trauma patient demographics, diagnosis, treatment, payer, provider, and other reasonably detailed trauma care information.

## **Justification for a State Wide Trauma Registry**

One of the chief aims of the state trauma system development process is to reduce the variation in trauma patient care and improve outcome in Massachusetts. Recent research indicates that relative risk of death may vary by more than three fold for similarly injured patients among the five EMS regions of the state. Only by quantifying injury incidence and outcome in all regions of the state can this variation be measured. This information can then inform plans aimed at reducing this variation. A second aim of trauma system development is to ensure all patients have access to top quality trauma care. Only by measuring where and when injury occurs can sensible decisions be made regarding resource allocation. Finally, we live in an era where planning for mass casualty events has become a paramount concern. Understanding how our trauma system works in the steady state is the most important first step we can make in anticipating the unusual events.

## **Brief Description of Process**

This report reflects the work of a diverse group who has met for a year to discuss the development of a statewide trauma registry. The Subcommittee includes representatives of community hospitals, trauma centers, Emergency Medical Services (EMS) providers, state agencies, and technical advisors (see Appendix for a list of members).

The Subcommittee's work has involved a review of American College of Surgeons (ACS) guidelines, Department of Public Health (DPH) reports, expert presentations and review of specially gathered data. DPH reports provided useful information on statewide trauma statistics (trauma hospital admissions and trauma-related deaths), as well as EMS system performance (regional and statewide review of EMS ground and air medical response to victims of fatal car crashes).

From the outset this process has focused on balancing the information requirements implied in optimal system management with the fiscal realities faced by the healthcare

infrastructure of the Commonwealth. At each step of the process, there was careful consideration of the potential reporting burden on providers.

## Key Characteristics of the Statewide Trauma Registry:

1. The following broad conceptual definition of trauma is recommended by the Subcommittee:

***Trauma is defined as tissue injury due to the direct effects of externally applied energy. Energy may be mechanical, thermal, electrical, electromagnetic or nuclear. Burns, isolated smoke inhalation, slip and fall and drowning will be included in the definition of trauma. Specific exclusions are toxic ingestion, poisoning and foreign body ingestion.***

A more formal definition of classification codes included and excluded in this definition must be developed.

2. The trauma data system will be population-based. The total number of such patients is estimated be about 50,000 per year statewide. Data on most injuries will be drawn from existing databases collected by the Division of Health Care Finance and Policy (DHCFP), i.e., the inpatient, outpatient observation stay, and emergency department (ED) databases. The system will collect specific clinical and other data on all persons, regardless of where they received care, in order to evaluate the performance of the trauma system.

3. The system will track all individuals who meet the definition of trauma and who also meet the following criteria:

- Are admitted to an observation stay;
- Are admitted to an inpatient unit;
- Are transferred to an acute care hospital; and
- Died, whether they died pre- or post- treatment.

4. Severity correction metrics that will be available for patients tracked by the trauma system. Revised Trauma Score (RTS) components (physiological metric) recorded directly, and Injury Severity Score (ISS) (anatomic metric), derived from case mix ICD-9 diagnosis codes will be utilized. These two scores, plus outcome, will be the key measures available for system evaluation. These metrics are accepted by the ACS and are supported by the medical literature.

5. The trauma registry system will include a mechanism for specially tagging encounters for injuries resulting from unusual events such as acts of terrorism.

# Architecture of the Statewide Trauma Registry

The registry will consist of several levels of varying complexity. The goal of this tiered system is to obtain the most information on the tracked patients in a population based manner at the least expense. Careful consideration has been given to administrative requirements for data acquisition and management. The proposed system provides the minimum data required for a population-based system with the smallest footprint.

**Tier 1.** The data system will incorporate statewide data already collected by the Division of Health Care Finance and Policy (DHCFP) for Emergency Department (ED), Observation, and Inpatient care. A following few elements to be added include:

- Time of discharge from the ED for transfers (*scheduled for collection in ED data beginning 10/1/02*);
- A second E-Code (if applicable); and
- To and from facility numbers for transfers.

**Tier 2.** System Hospitals (hospitals not designated as level 1, 2 or 3) will be required to submit the new data elements shown below on all patients tracked by the system. These elements are routinely recorded in the medical record. The elements reflect the RTS components derived from the first set of measurements taken after arrival in the ED:

- The Glasgow Coma Score (GCS) components (eye, motor, verbal)
- GCS qualifier code
- Respiration rate
- Blood Pressure
- Location of Injury E-Code

The Subcommittee recognizes that there is a need to create a process to collect the few new Tier 2 data elements.

**Tier 3.** The data system will incorporate a subset of trauma registry data typically collected by Level 1, 2 and 3 trauma centers. The trauma registry data will be generally compatible with the ACS's National Trauma Data Bank (NTDB), and include:

- All applicable 7-digit Abbreviated Injury Scale (AIS)-90 codes;
- Location of Injury E-Codes; and
- Time of discharge from the ED (for transfers only).

Tier 3 is the "richest" set of data. Some modification of the NTDB dictionary will be necessary to correct inconsistencies and cumbersome conventions present in this database.

**Tier 4.** The data system will incorporate data abstracted from the Office of the Chief Medical Examiner (OCME) regarding all trauma-related deaths statewide. This data will

include 7-digit AIS-90 codes and Injury Severity Scores. The Subcommittee recommends that any legislation necessary to permit and support such data collection and sharing by the OCME be enacted. Furthermore the Subcommittee recommends that a more formal partnership be established between DPH and the Medical Examiner to support the coding and data management requirements of this system.

## **Proposed Linkage**

To reduce the burden of data collection on hospitals and other providers, the Subcommittee recommends the extensive use of data linkage and development of a linkage plan that follows an approach presented by a linkage expert. Specific linkage details need to be more fully developed, but the following types of linkage are anticipated:

- Linkage of DHCFP databases with Tier 2 and 3 data as described above. A pilot project to develop and validate linkage method is planned. Chief Information Officers of Boston Medical Center, Partners and Care Group have all volunteered human and computer resources to this project.
- Potential linkage to other data bases, such as pre-hospital services, and rehabilitation, etc. will be possible as these data bases are developed.
- Technical issues and timeliness of data acquisition will need to be addressed by DPH via piloting data associations, piloting linkage feasibility, trauma software training and technical working groups.

## **Data Access**

Data access to the Trauma Registry data will be modeled after the current DHCFP procedures. This will ensure access to a broad range of qualified users, including entities contributing to the trauma registry, while protecting individual patient confidentiality. Standard reports will be routinely generated on the system and provided to the hospitals.

## **Patient Confidentiality**

Steps will be taken throughout the development of the database to stringently assure patient confidentiality.

## **Educational Issues**

Appropriate training should be provided to entities contributing data to assure data quality, consistency and completeness.

# Mass Casualty Incident Tracking

A method should be developed to track victims of mass casualty or terrorism incidents using the existing health care databases, i.e. pre-hospital, ED, Observation stays, inpatient discharges, and medical examiner databases.

## Support

Additional funds will be needed to support data collection, training, data association, linkage, quality control and analysis for the Trauma Registry.

# Appendices

## I. List of Presentations to the Subcommittee:

- a) Fred Millham, M.D., MBA, Boston University Medical Center - Physiological Severity Measures, Revised Trauma Score, Glasgow Coma Score
- b) Elizabeth Garthe, M.H.S., Garthe Associates - Anatomic Severity Measure Proposed (AIS, ISS, ICD to AIS maps), Importance of Population-based data, Proposed Severity Coding of All Trauma-related Deaths
- c) Nick Mango, B.S.M.E., Garthe Associates - Overview of a Proposed Data Linkage Approach
- d) Ann Marie Mires, Ph.D., Medical Examiner's Office - Overview of M.E. Data
- e) Nancy Krieger, Ph.D., Public Health Uses of Geographic Data

## II. Subcommittee Membership List & Staff

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Note: Elizabeth Garthe is serving in two roles, as a member of the Data Subcommittee and as a Technical Advisor to the DPH and Statewide Trauma Committee. On behalf of the DPH, Garthe Associates prepared reports on statewide trauma deaths, inpatient trauma cases, cause and location E-codes as well as a summary of treatment at hospitals with or without trauma registries.



### **III. List of Reports Used:**

Massachusetts State Trauma Plan 1995 prepared under the auspices of the Massachusetts Department of Public Health, Bureau of Health Quality Management, Office of Emergency Medical Services

BHCQ/DPH Report: Statewide Trauma-related Hospital Discharges Fiscal Year 1999 - includes tables on all in-patient hospital trauma patients by region, severity and type of hospital prepared by Garthe Associates

Data runs of subsets of NTDB data prepared by Dr. Fred Millham, BUMC

BHCQ/DPH Report: Review of Trauma-related Deaths - Massachusetts Statewide Calendar Year 1999 - by region and type of location of death prepared by Garthe Associates

BHCQ/DPH surveys of hospitals with trauma registries and hospitals with ACS verification prepared by Sylvia Hobbs

BHCQ/DPH & GHSB report on EMS system response to all victims of fatal level car crashes prepared by Garthe Associates

Summary of inpatient trauma patients treated at hospitals with or without trauma registries for all trauma and major (ISS>15) trauma - prepared for BHCQ/DPH & Data Subcommittee by Nick Mango, Garthe Associates

Statewide Distributions of Cause and Location E-codes for inpatient trauma patients prepared by Nick Mango (GA) & Holly Hackman (DPH) for the Data Subcommittee

Summary of a Proposed Data Flow based on Nick Mango's Linkage Presentation to the Data Subcommittee - drafted by Jerry O'Keefe & Kathy Fuda and submitted to Nick Mango for review and revision.

### **IV. References:**

Resources for Optimal Care of the Injured Patient, 1993, American College of Surgeons, Committee On Trauma

Resources for Optimal Care of the Injured Patient, 1999, American College of Surgeons, Committee On Trauma

Baker, SP, O'Neill B, Haddon W Jr. et al: The Injury Severity Score: A method for describing patients with multiple injuries and evaluating emergency care. J Trauma 1974; 14: 187-196.

Garthe, E., Prenney, B., Mango, N. "Regional Review of Air Medical Transports for Fatal Level Motor Vehicle Crashes", Air Medical Journal 2000; 19:83-9. Regional EMS

response to victims of fatal car crashes - study conducted on behalf of BHQM, DPH by Garthe Associates.

Mango N., Garthe E., Sugarman P. "A Method To Collect Multiple Years Of Regional Emergency Department Visits: An Important Source Of Injury Data" accepted for presentation at the 6th World Conference on Injury Prevention and Control, Montreal, May 2002.

Lucas, CE; KJ Buechter; RL Coscia; JM Hurst; JW Meredith; Middleton, JD; FL Mitchell; CF Rinker; D Tuggle; J Wilberger; A Vlahos: Effect of Trauma Registry Program on Reported Mortality Rates, *J Trauma* 1999; 47:211

Garthe E., States John, Mango N. "Abbreviated Injury Scale Unification: The Case for a Unified Injury System for Global Use". *J Trauma*. 1999; 47:309-323.

Garthe, E., "Overview of Trauma Registries in the United States", the Journal of the American Health Information Management Association (AHIMA), July/August, 1997.

MacKenzie, E., Garthe E.: "Compatibility of the ICD-9-CM and AIS-80 - An Update." Association for the Advancement of Automotive Medicine, Quarterly Journal 1983; 5:25-27.

Garthe, E. "The Compatibility Between the Abbreviated Injury Scale (AIS-80) and the International Classification of Diseases (ICD-9-CM)." Presented at the Annual Meeting of the American Association of Automotive Medicine, San Francisco, California, 1981. Published in the Quarterly Journal of the AAAM, March 1982. Recipient of the Dr. John States Award.

MacKenzie, EJ, Steinwachs, MD and Shankar, B. "Classifying Trauma Severity Based on Hospital Discharge Diagnoses: Validation of an ICD-9-CM to AIS-85 Conversion Table," *Medical Care*, 1989; 27: 412.

# **Designation**

**The consensus of this Subcommittee is represented in the following recommendations:**

## **Inclusiveness**

1. All acute care hospitals within the state will participate in the trauma system. All acute care hospitals regardless of their level of designation will be required to submit data as recommended by the Trauma System data Subcommittee.
2. At this time, the involvement of rehabilitation hospitals has yet to be determined and there is no formal designation process at this time.

## **Verification/Designation**

3. Verification and subsequent designation as a trauma center is voluntary and hospitals may chose to become a level 1, 2 or 3 trauma center. All other acute care hospitals in the state will be assigned designation status as a System Hospital. There will not be a designation for emergency departments as lone entities. Hospitals will participate in a QA/QI review process for patient care and outcomes.
4. The verification authority for level 1, 2 and 3, will be the American College of Surgeons (ACS) and the Department shall recognize any verifications in existence on 3/26/02. For an interim period until a formal designation process is in place, any ACS verified facility and any facility identified as a trauma center/facility in a regional point of entry plan shall be able to advertise/promote itself as a trauma facility, prior to the establishment of the formal designation process. At the conclusion of the interim period, only a hospital designated by the state may advertise/promote itself as a trauma center. There is no grand fathering process for non-ACS verified hospitals at the conclusion of the interim period.
5. A hospital may seek separate verification and designation for pediatrics, per the ACS process.
6. Once ACS has awarded verification, the hospital has 30 days to submit a copy of their verification to the Department of Health for designation along with their application for designation and relevant information. The application packet will consist of:
  - A copy of the ACS verification with Administration sign off
  - Completed and signed application
  - Organizational Chart
  - Transfer agreements
  - Agreement to participate in the Trauma registry
  - QA/QI plan for evaluating patient outcomes

7. All designation will be for a three (3) year period. All other facilities will be designated at the time of the license renewal.

### **Requirements for all other facilities**

8. All non-trauma center acute care facilities (System Hospitals) receiving patients in the Emergency Department will meet the following requirements:
  - Submit data as outlined by the Department.
  - Respond and adjust care as deemed necessary per review of data.

### **Transport/Facility Location Issues**

9. Designated Trauma centers will be required to provide consultation and have transfer agreements with lower level facilities and accept request for transfer from lower level facilities. Level 2 and 3 trauma centers and System Hospitals will be required to have transfer agreements with Level 1 and 2 trauma centers.
10. The system will encourage and promote appropriate transfers of patients to either a rehabilitation facility or back to the referring community hospital, in an effort to enhance patient flow through the continuum of care and open beds for incoming acute trauma patients.

### **Reverification Process**

11. A condition of designation will be maintenance of verification status. A loss in verification status will result in a loss of designation.

### **Dedesignation/Redesignation**

12. Designation and redesignation will utilize the same application, completed as per the instructions. Designation is valid for 3 years as long as verification remains valid and all requirements for verification and designation are met on a continual basis.
13. Hospitals may voluntarily dedesignate if they no longer choose to, or are unable to maintain their designated level of services. Designated facilities will agree to abide by a process to be followed should the facility decide to voluntarily relinquish its designation status. Voluntary dedesignation may take place at any time within the 3-year period of designation. A facility must notify the Commissioner of Public Health in writing at the time they decide to voluntarily seek dedesignation.
14. The system to be established will allow for actions to be taken by the Department should a designated facility fail to meet or maintain conditions and requirements associated with verification and designation, up and to including dedesignation.

## **Specialty Designation (other than Rehabilitation and Pediatric)**

15. Designation as a Burn center will be awarded with successful verification from ABA (American Burn Association) and ACS.

### **Incentives**

16. The designation Subcommittee recommends financial incentives be explored by the State Trauma Committee as a way to assure appropriate numbers, distribution and levels of designated facilities within the state, to sustain and optimize the care provided by a formal statewide trauma system.

### **Disaster Management/MCI**

17. The Trauma System will encompass a Statewide Disaster/MCI plan that works in harmony with the Massachusetts Emergency Management Agency's plan for the Commonwealth as well as regional plans within the state. The plan will include:
  - a. Uniform terminology
  - b. EMS training requirements
  - c. Interaction with the Department of Public Safety and other relevant state, local, community and federal agencies
  - d. Communications
  - e. Transportation
  - f. Distribution of patients

### **QA/QI**

18. Refinement of the trauma system plan and the designation process will be data driven.
19. As part of the trauma system and designation process, the Department will maintain an advisory body to monitor the trauma system.
20. Trauma System QA/QI process will be similar to and comparable to other state healthcare QA/QI processes.

The Subcommittee has not yet covered or finalized the following recommendations:

- Involvement of rehabilitation hospitals.
- Designation of rehabilitation hospitals.

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## **Clinical**

## **The consensus of this Subcommittee is represented in the following recommendations**

### **Point of Entry**

1. The protocols and guidelines developed are intended to be utilized as such to assist the on-scene and hospital staff in making patient care decisions and not be seen as rigid standards of practice.
2. Clinical criteria will continue to be a work in progress as changes in patient care practices come about in relation to technology, education, research and evaluations of outcomes provided through the data registry.
3. The 20-minute transport rule will serve as a guideline for EMS. Weather, traffic, the individual EMT's experience, the circumstances of the event, the location, mechanism of injury, existence of a trauma center in the area and other variables will also be taken into consideration

### **Pediatrics**

4. Pediatric age is defined as under the age of 15.
5. Pediatric patients should be taken to or transferred to an appropriate pediatric level trauma center for definitive care.
6. The adolescent population (15-18), has specific needs that need to be addressed by the receiving facilities.

### **Air Medical Transport Protocol**

7. The current Air Medical Transport protocol in existence will serve as the recommended protocol with minor changes to match the Point of Entry Guidelines.

### **Interfacility Transfer**

8. Interfacility transfer guidelines will cover patients sent from a System Hospital or a lower level trauma center to a higher-level appropriate level trauma center.

The attached documents include:

- I) Trauma Field Triage Criteria and Point of Entry Plan
- II) Air Medical Transport Protocol
- III) Pediatric Triage Guidelines
- IV) Interfacility Transfer Guidelines

The Subcommittee has not yet covered or finalized the following recommendations:

- Trauma Education criteria for EMS and hospital staff
- Transfer back to the community setting or lower level trauma center
- Medical Direction and oversight (EMCAB's Medical Services Committee is dealing with this)
- Communications Plan

# I. TRAUMA FIELD TRIAGE CRITERIA and POINT-OF-ENTRY PLAN For ADULT and PEDIATRIC PATIENTS

NOTE: Additional pediatric-specific information can be found on the next page. **Early notification of the receiving facility, even from the scene, will enhance patient care.**

## Traumatic Incident

Preconfigured response initiated/appropriate pre-arrival instructions given based on Local EMD

### Perform Primary Survey

#### 1) Does the patient have:

- Uncontrolled airway?
- Cardiopulmonary arrest?

YES

**IMMEDIATELY LIFE  
THREATENING**

**Transport immediately  
to nearest hospital**

NO

#### 2) Does the patient have:

- Sustained consciousness, decreasing level of consciousness, or GCS  $\leq$  13?
- Severe respiratory distress (rate  $< 10$  or  $> 29$ ) or respiratory rate out of range for age? (see next page for pediatric)
- Flail Chest?
- Systolic blood pressure  $< 90$  in adults or  $< 70$  to  $90$  in pediatrics? (see next page)
- Open or depressed skull fractures?
- Penetrating trauma to head, neck, torso, or extremities proximal to elbow and knee?
- Tender or rigid abdomen?
- Pelvic fractures (excluding simple fractures)
- Paralysis or motor/sensory deficit?
- 2 or more proximal long bone fractures, or any open proximal long bone fracture?
- Amputations, with exception of distal digits?
- Critical burns? (see note).

YES

**CRITICAL  
TRAUMA**

#### Transport to:

- If  $< 20$  minutes by ground, transport to a level 1 or 2 trauma center or level 1 or 2 trauma center (level 1 or 2 pediatric trauma center for pediatrics).
- If  $< 20$  minutes by ground from a level 3 trauma center and no level 1 or 2 (level 1 or 2 pediatric trauma center for pediatrics) within 20 minutes, transport to a level 3 and/or consider aeromedical if available.
- If  $> 20$  minutes by ground to a level 1, 2 or 3 trauma center, activate aeromedical if available.
- If  $> 20$  minutes by ground to a level 1, 2 or 3 trauma center and no aeromedical available, transport to the nearest system hospital.

*At all times contact with Medical Control  
re: Destination is encouraged*

NO

#### 3) Is there evidence of mechanism of injury and/or high energy impact?

- Ejection from the vehicle
- Death in same passenger compartment
- Extrication time  $> 20$  minutes
- Falls  $> 15$  feet, or  $> 3$  times child's height
- High speed crash
- Auto vs. pedestrian, or auto vs. bicycle with significant impact
- Pedestrian thrown or run over
- Motorcycle crash  $> 20$  mph, or with separation of rider from bike
- Near drowning

NO

**Transport to closest appropriate System Hospital**

Interfacility Transfer as necessary

### CRITICAL BURNS

- Partial thickness burns  $> 10\%$  BSA
- Extensive burns involving face, genitalia, perineum
- 3<sup>rd</sup> degree burns in any age group
- Electrical Burns, including lightning injury
- Chemical Burns
- Inhalation Burns
- Any burn in combination with trauma

YES

**Consider medical control re: Destination hospital. \*\***

**Transport to Level 1, 2, or 3 Trauma Center if no medical control. If  $> 20$  minutes away, go to closest System Hospital.**

Co-morbid Factors which may increase severity of injury:

- Age  $< 5$  or  $> 70$
- Significant cardiac or respiratory disease
- Pregnancy
- Insulin dependent diabetes, cirrhosis, morbid obesity
- Immunosuppressed
- Bleeding disorder or currently taking anticoagulants

\*\* At all times, EMS providers are encouraged to contact medical control for direction in triage of trauma patients.

## GLASGOW COMA SCALE

INFANTS & TODDLERS			CHILDREN & ADULTS		
EYE OPENING	Spontaneous	4	EYE OPENING	Spontaneous	4
	To voice	3		To voice	3
	To pain	2		To pain	2
	None	1		None	1
BEST VERBAL RESPONSE	Smiles, interacts	5	BEST VERBAL RESPONSE	Oriented	5
	Consolable	4		Confused	4
	Cries to pain	3		Inappropriate words	3
	Moans to pain	2		Incomprehensible words	2
	None	1		None	1
BEST MOTOR RESPONSE	Normal spot. movement	6	BEST MOTOR RESPONSE	Obeys commands	6
	Localizes pain	5		Localizes pain	5
	Withdraws to pain	4		Withdraws (pain)	4
	Abnormal flexion	3		Flexion (pain)	3
	Abnormal extension	2		Extension (pain)	2
	None	1		None	1

## PEDIATRIC VITAL SIGNS *(Pediatric is <age 15, adolescent is age 15-18)*

Age in Years	Weight in Kg	Respiratory Rate	Heart Rate	Systolic Blood Press.
Newborn	3-5	30-60	100-160	60-80
6 mos.	7	25-40	90-120	80-100
1 yr.	10	20-30	90-120	80-100
18 mos.	12	20-30	80-120	80-110
3 yrs.	15	20-30	80-120	80-110
5 yrs.	20	18-24	70-110	80-110
6 yrs.	20	18-24	80-100	80-110
8 yrs.	25	18-24	70-110	80-110
10 yrs.	30	16-20	70-110	80-110
12 yrs.	40	16-20	60-110	90-120
14 yrs.	50	16-20	60-105	90-120
16 yrs.	60	16-20	60-80	80-120
18 yrs.	70	16-20	60-80	80-120

## II. AIR MEDICAL TRANSPORT PROTOCOLS



**Statewide Trauma Triage Guidelines for  
Air Medical Services  
March 2002**

**Introduction:**

The use of air medical services has become the standard of care for many critically ill or injured patients who require transport to specialized medical facilities such as Trauma Centers.

The purpose of these Guidelines is to establish a clinical framework for prehospital EMS personnel upon which to make decisions regarding when to access air medical support services. The following constitute the philosophical foundation for these Guidelines.

- EMS personnel should consider requesting ground advanced life support (ALS) and air medical support when operational conditions listed below exist and the following patient conditions are present;
- Patients with an uncontrolled or compromised airway should be brought to the nearest appropriate facility unless advanced life support (ALS) service (by ground or air) can intercept in a more timely fashion; and:
- Patients in cardiac arrest subsequent to blunt trauma should be taken to the nearest facility.

These guidelines have been established so that air medical support does not require prior Medical Control approval. However, Medical Control contact should be considered whenever appropriate for patient management issues.

**OPERATIONAL CONDITIONS:**

1. When a patient meets patient criteria defined below and scene arrival time to estimated arrival time at the nearest appropriate hospital, including extrication time, exceeds 20 minutes:
2. Patient location, weather or road conditions preclude the use of standard ground ambulance; or
3. Multiple casualties / patients are present which will exceed the capabilities of local hospital and agencies.

**PATIENT CONDITIONS:**

1. Sustained unconsciousness, decreasing level of consciousness or GSC < 13
2. Severe respiratory distress (rate <10 or > 29) or respiratory rate out of range for age
3. Flail chest
4. Systolic blood pressure < 90 in adults or < 70-90 in children
5. Open or depressed skull fracture

6. Penetrating trauma to the head, neck, torso or extremities proximal to the elbow and knee
7. Tender or rigid abdomen
8. Pelvic fractures (excluding simple fractures)
9. Paralysis or motor/sensory deficit
10. Two or more proximal long bone fractures or any open proximal long bone fracture
11. Amputations with exception of distal digits
12. Critical burns

### **Mechanism of Injury Conditions**

1. Ejection from vehicle
2. Death of person in same passenger compartment
3. Extrication time > 20 minutes
4. Falls > 15 feet or > 3 times the child's height
5. High speed chase
6. Auto vs. pedestrian or auto vs. bicycles with significant impact
7. Pedestrian thrown or run over
8. Motorcycle crash > 20 mph or with separation of rider from bike
9. Near drowning

These conditions are useful guides, and not intended to be strict protocols. The judgments of the professionals at the scene are the most important element in making decisions about the use of aeromedical transport.

### III. RECOMMENDATIONS FOR PEDIATRIC TRAUMA CARE Triage Guidelines

#### 1. Definitions:

CHILD: Birth to 15 years

ADOLESCENT: 15 to 18 years

ADULT: 18 years and older

#### 2. Adolescent Care:

Adolescence is a time of rapid growth and development. It is also a time when mental health issues such as depression, anxiety, eating disorders, substance use, and family struggles can become prominent. Patients in this age group have special needs for confidentiality and consent so that they can understand their choices in health care decision-making.

In hospitals caring for critically injured adolescents who will be admitted for prolonged periods, attention should be given to offering an environment that recognizes the special strengths and challenges of this age group, including medical, mental health, educational, and family perspectives.

Because adolescents can vary considerably in their level of physical and emotional maturity, the final decision to admit or transfer should be left to the attending physician.

It is recommended that hospitals admitting 15 to 18 year-olds that are critically injured and likely to have prolonged hospital stays have the following resources available:

- a. Direct or telephone access to consultation with specialists in
  - adolescent medicine
  - adolescent mental health (psychiatry, psychology, social work)
  - child life
  - rehabilitation
- b. The hospital should have a venue for case management which addresses the implications of the trauma for both the immediate and long-term health of that adolescent, including issues related to body image, participation in activities, educational goals and school re-entry, sexuality, and mental health. Hospitals that do not have these special resources for adolescents are encouraged to have a formalized relationship with a pediatric trauma center that can provide back-up consultation when needed.
- c. Equipment and expertise pertinent to the needs of adolescents, such as resources for the treatment of orthopedic injuries during periods of rapid bone growth and maturation.

- d. Resources for education follow-up. Public schools are required by law to provide tutors for students who have prolonged hospitalizations and/or are out of school for more than 14 days.
- e. Facilities for parents to stay overnight.
- f. Consent forms that recognize the rights of minors to make health care decisions, as well as policies for emancipated minors. Forms and policies should be consistent with current state statutes.

### **3. Point of Entry for ALL Pediatric Patients:**

Providers should review the state's current Point of Entry Plan.

Pediatric trauma patients who are critically injured and unstable should be taken to the closest hospital. Unstable patients may be taken to a pediatric trauma center by helicopter if this is considered optimal in the judgment of the EMS providers at the scene and/or medical control.

Pediatric trauma patients who are critically injured and stable enough to bypass the nearest hospital:

- If < 20 minutes by ground, should be transported to a level 1 or 2 pediatric trauma center.
- If < 20 minutes by ground from a level 3 trauma center and no level 1 or 2 pediatric trauma center or level 1 or 2 adult trauma center within 20 minutes, transport to a level 3 and/or consider aeromedical if available.
- If > 20 minutes by ground to a level 1, 2 or 3 trauma center, activate aeromedical if available.
- If > 20 minutes by ground to a level 1, 2 or 3 trauma center and no aeromedical available, transport to the nearest system hospital.
- Pediatric trauma patients who are not critically injured should be taken to the closest hospital.

Pediatric trauma patients who are not critically injured should be taken to the closest hospital.

**NOTE:** There are many children with special health care needs whose baselines may be considered unstable to EMS providers but stable according to the family or caregiver. It is recommended that whenever possible EMS providers consult with parents or caregivers of children with special health care needs while determining the child's stability.

#### **4. Emergency Departments Providing Pediatric Care:**

Hospital Emergency Departments providing care for the purpose of triaging and stabilizing children should follow the non-mandatory recommendations contained in the *Guidelines for Pediatric Care in the Emergency Department*, developed by the Pediatric Resource Group, Emergency Medical Services for Children Project, Feb. 2001. Several sections of this document are attached.

## ATTACHMENT A: RECOMMENDATIONS FOR EDUCATION AND TRAINING OF EMERGENCY DEPARTMENT PHYSICIANS

Emergency departments (EDs) play a critical role in providing acute trauma care to pediatric patients. Because EDs that provide care to children must assume the responsibility for triage and stabilization of critically injured pediatric patients, timely and effective pediatric emergency care requires appropriately trained clinical staff. Physician leadership is crucial in the area of direct patient care, as well as in administration, quality improvement, and clinical operations.

EDs that provide trauma care to children on a regular basis should develop guidelines for physician training and education consistent with the level of care they provide. The following would be recommended as minimal training and education requirements:

### Training – ED Physicians

- Residency training and/or board certification in pediatrics, emergency medicine or family medicine;
- Training can be enhanced by successful completion of fellowship in Pediatric Emergency Medicine. However, most PEM-trained physicians will work in children's hospitals with high-volume, freestanding pediatric emergency departments.
- In addition, emergency department physicians should seek to supplement their own pediatric experience with specific clinical courses, such as:
  1. Pediatric Advanced Life Support (PALS) or Advanced Pediatric Life Support (APLS) – Strongly Recommended
  2. Advanced Trauma Life Support (ATLS)

### Continuing Education

In order to maintain competencies in pediatric clinical practice, ED physicians should utilize educational opportunities to enhance their clinical training. Annual license renewal should include CME credits devoted to the trauma care of the pediatric patient, such as:

1. PALS retraining course
2. Category 1 CME courses accredited by the American College of Emergency Physicians, the American Academy of Pediatrics, or the American College of Surgeons
3. Trauma/Pediatric Trauma, e.g. ATLS

## Other Issues

The hospital should appoint an ED staff physician to assume responsibility for performance improvement in the trauma care of pediatric patients.

***Emergency departments should supplement the education and training of physicians with a departmental commitment to activities such as:***

1. Pediatric quality improvement activities, including regular chart review;
2. Case reviews and on-site pediatric education; and
3. Regular review of mock scenarios to familiarize staff with pediatric trauma emergencies.

**ATTACHMENT B: RECOMMENDATIONS FOR EDUCATION AND TRAINING OF EMERGENCY DEPARTMENT NURSES**

Optimal care of the pediatric patient is best achieved within a framework where all members of the ED staff utilize a systematic and standardized approach to the care of the pediatric patient.

Emergency nurses who care for children must be knowledgeable about injury/disease prevention strategies, pediatric triage, assessment and prioritization, nursing assessment of children and adolescents, and the appropriate interventions to decrease morbidity and prevent mortality. Emergency nurses must also participate in departmental quality improvement programs to enhance the delivery of care to children

In compliance with JCAHO standards, demonstration of nursing competency in the provision of care to different age groups of children must be provided.

This may be accomplished through the inclusion of pediatric criteria in the ED's competency-based orientation and annual skill stations lab. Please refer to Section 7 of this document for details related to competencies.

## Basic Nursing Education:

- Successful completion of an accredited nursing education program
- Current licensure in the Commonwealth of Massachusetts

## Continuing Education

- Successful completion of any continuing education programs required by the individual hospital
- The recommended minimum educational standard for registered nurses providing emergency care to children is the Emergency Nursing Pediatric Course - Provider (ENPC), or a similar nursing core pediatric course with age-based competencies that meet JCAHO standards.
- ED nurses should seek additional pediatric clinical courses, such as the Pediatric Advanced Life Support (PALS) provider course.

## **ATTACHMENT C: GUIDELINES FOR PEDIATRIC EQUIPMENT AND SUPPLIES FOR EMERGENCY DEPARTMENTS**

The following guidelines were developed by the Committee on Pediatric Equipment and Supplies for Emergency Departments, National Emergency Medical Services for Children Resource Alliance. The guidelines appeared simultaneously in the Annals of Emergency Medicine and the Journal of Emergency Nursing and Pediatric Emergency Care in January 1998.

Background:

Although guidelines for equipment and supplies for EDs have been adopted by national organizations and published in pediatric emergency textbooks, until recently there was no consensus on what constituted minimum equipment and supplies to care for pediatric patients in the ED setting.

The following guidelines for pediatric equipment and supplies for EDs were developed by a consensus process by a group of individuals representing the following organizations and agencies:

The Committee on Pediatric Emergency Medicine of [the] American Academy of Pediatrics

The Section on Surgery of the American Academy of Pediatrics

The American Association of Respiratory Care

The American College of Emergency Physicians

The American College of Surgeons

The American Hospital Association

The Ambulatory Pediatric Association

The Emergency Nurses Association

Kaiser Permanente Health System

The National Association of Children's Hospitals and Related Institutions

The National EMSC Resource Alliance

The National Rural Health Association<sup>1</sup>

### **Essential Equipment and Supplies:**

#### ***1. Monitoring***

- ❖ Cardio respiratory monitor with strip recorder
- ❖ Defibrillator (0-400 J capability) with pediatric and adult paddles (4.5 cm and 8 cm)
- ❖ Pediatric and adult monitor electrodes
- ❖ Pulse oximeter with sensors, sizes newborn through adult

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<sup>1</sup> Committee on Pediatric Equipment and Supplies for Emergency Departments, National Emergency Medical Services for Children Resource Alliance, "Guidelines for Pediatric Equipment and Supplies for Emergency Departments," Annals of Emergency Medicine, 31:1, January 1998, pp. 54-57.



- ❖ Thermometer/rectal probe (suitable for hypothermic and hyperthermic measurements), with temperature capability from 25 – 44 deg. C.
- ❖ Sphygmomanometer
- ❖ Doppler blood pressure device
- ❖ Blood pressure cuffs - neonatal, infant, child, adult, and thigh sizes
- ❖ Method to monitor endotracheal tube and placement (may be satisfied by disposable ETCO<sub>2</sub> detector, bulb, or feeding tube methods for endotracheal tube placement)

## **2. *Vascular Access***

- ❖ Butterfly needles, 19- to 25-gauge
- ❖ Catheter-over-needle devices, 14- to 24-gauge
- ❖ Infusion device (to regulate rate and volume)
- ❖ Tubing for above
- ❖ Intraosseous needles, 16- and 18-gauge (may be satisfied by standard bone marrow aspiration needles, 13- or 15-gauge)
- ❖ Arm boards - infant, child, and adult sizes
- ❖ Intravenous fluid/blood warmers
- ❖ Umbilical vein catheters, sizes 3.5 Fr and 5 Fr (available within the hospital)
- ❖ Seldinger technique vascular access kit, with pediatric sizes 3,4,5 Fr catheters

## **3. *Airway Management***

- ❖ Clear oxygen masks - preterm, infant, child, and adult sizes
- ❖ Non-rebreathing masks – infant, child, and adult sizes
- ❖ Oral airways, sizes 00-5
- ❖ Nasopharyngeal airways, sizes 12 to 30 Fr
- ❖ Bag-valve-mask resuscitator, self-inflating, 450 and 1,000 ml sizes
- ❖ Nasal cannulae – infant, child, and adult sizes
- ❖ Endotracheal tubes: uncuffed, sizes 2.5 to 8.5, and cuffed, sizes 5.5 to 9
- ❖ Stylets, pediatric and adult sizes
- ❖ Laryngoscope handle, pediatric and adult
- ❖ Laryngoscope blades: curved, sizes 2 and 3, and straight, sizes 0 to 3
- ❖ Magill forceps, pediatric and adult
- ❖ Nasogastric tubes, sizes 6 to 14 Fr
- ❖ Suction catheters: flexible, sizes 5 to 16 Fr, and Yankauer suction tip
- ❖ Chest tubes, sizes 8 to 40 Fr
- ❖ Tracheostomy tubes, sizes 00 to 6 (Ensure availability of pediatric sizes within the hospital.)
- ❖ Rescue breathing equipment approved for pediatrics, such as LMA

## **4. *Miscellaneous***

- ❖ Infant and standard scales
- ❖ Infant formula and oral rehydrating solutions
- ❖ Heating source (may be met by infrared lamps or overhead warmer) for neonates and children under 2 years
- ❖ Towel rolls/blanket rolls or equivalent
- ❖ Pediatric restraining devices

- ❖ Resuscitation board
- ❖ Sterile linen (available within hospital for burn care)

### **5. *Specialized Pediatric Trays***

- ❖ Tube thoracotomy with water seal drainage capability
- ❖ Lumbar puncture spinal needle, sizes 20-, 22-, and 25-gauge
- ❖ Urinary catheterization with pediatric Foley catheters, sizes 5 to 16 Fr
- ❖ Obstetric pack
- ❖ Newborn kit
  - Umbilical vessel cannulations supplies
  - Meconium aspirator
- ❖ Venous cutdown
- ❖ Surgical airway kit (May include any of the following items: tracheotomy tray, cricothyrotomy tray, ETJV needle jet.)

### **6. *Fracture Management***

- ❖ Cervical immobilization equipment, sizes child to adult. Many types of cervical immobilization devices are available; these include wedges and collars. The type of device chosen depends on local preference, policies and procedures. Whatever device is chosen should be stocked in sizes to fit infants, children, adolescents, and adults. The use of sandbags to meet this requirement is discouraged because they may cause injury if the patient has to be turned.
- ❖ Extremity splints
- ❖ Femur splints, child and adult sizes

### **7. *Desirable Equipment and Supplies***

- ❖ Medical photography capability

## **ATTACHMENT D: PEDIATRIC RESUSCITATION MEDICATIONS**

The ED should have a medication chart, tape, or other system to ensure ready access to information on proper per-kilogram doses for resuscitation drugs and equipment sizes. A system for estimating medication doses and supplies may use the length-based method with color codes, or other predetermined weight (kilogram)/dose method.

Pediatric resuscitation medications will be based on the most current guidelines available from the American Heart Association, see *Handbook of Emergency Cardiovascular Care for Health Care Providers*, also see the American Academy of Pediatrics *Care of Children in the Emergency Department: Guidelines for Preparedness*.

\* \* \* \* \*

For further information on pediatric care in the hospital Emergency Department, please refer to the ***Guidelines for Pediatric Care in the Emergency Department***, developed by the Massachusetts Emergency Care Advisory Board (EMCAB) Pediatric Resource Group.

### **III. INTERFACILITY TRANSFER GUIDELINES FOR THE TRAUMA PATIENT**

The majority of patients sustaining injury will be able to receive appropriate and comprehensive care in local hospitals. However, patients with critical injury require transport to Level I/II trauma centers. Facilities need to assess their own capabilities and resources with regard to care capabilities for the trauma patient. Facilities should ensure early identification and transport of the trauma patient to an appropriate treatment setting.

## **Interfacility Transfer Guidelines**

1. When a patient requires care unavailable at the current setting, it is the responsibility of the treating physician to arrange for the necessary care to come to the patient, or to transfer the patient to that care by the most appropriate method.
2. The transfer of a patient to the care of others is warranted when the treating physician responsible for the patient determines that the patient's needs can best be met through transfer.
3. The transferring physician bears the responsibility for initiating the transfer of the patient to the receiving institution and for stabilization of the patient within the capabilities of the sending institution. Patients whose needs cannot be met at the current facility and whose best chance for positive outcome is in transfer may be transported in an unstable condition. However, it is the responsibility of the transferring physician to provide the best stabilization possible without delaying transfer, and to document the rationale for transferring an unstable patient.
4. The patient's current care provider arranges the proper and best available transfer vehicle and level of care for the patient given the circumstances of the individual patient.
5. The choice of vehicle and transfer care providers is made after consideration of medical factors including known medical problems, potential problems/complications, medical needs (time-limited treatment, tertiary care, special therapy), available resources, and other factors such as weather, traffic, and geography.
6. Established and accepted guidelines should be used in conjunction with those factors to select the appropriate vehicle/medical team combination for each patient. Acceptable criteria may include risk for problems or complications based upon mechanism of injury or medical condition as well as known conditions.
7. The transfer should not occur until the patient's treating physician is confident that the mode of transfer meets the patient's known and expected needs, the receiving facility is prepared to care for the patient and will receive all necessary information to best give that care, and the patient or responsible party has consented to the transfer if possible.

8. The receiving physician may provide advice regarding options for transportation, timing of transfer, and pretransfer stabilization. The receiving physician must ensure that his/her institution is qualified, able, and willing to accept the patient.
9. The sending Physician should make contact with the receiving Physician, even if the choice of the receiving hospital is from the Boston MedFlight or UMass LifeFlight roster, to confirm that the receiving hospital is capable of handling the patient and to discuss what care has been given and what should be done on route.
10. The sending and receiving physicians should not delay trauma patient transport for laboratory, x-ray, and diagnostic procedures that do not change the immediate plan of care. It is expected that designated trauma centers will be ready and available to accept the trauma patient. A receiving facility should not inordinately delay the transfer of a trauma patient for any reason.
11. Transfers occurring between acute care and rehabilitation facilities involve patients who are relatively stable. However, these transports should be conducted with the same attention to the above guidelines as other transfers. Patients should be transferred only after appropriate communication between facilities.

## Clinical Guidelines for Interfacility Transfer

1. The American College of Surgeons has developed interhospital transfer guidelines for trauma patients. The following criteria suggest the possible need for early transfer to a Level I/II trauma center.
2. These criteria are designed to be prompts only and are not inclusive or hospital specific.
3. These guidelines should be utilized as designed by the American College of Surgeons as suggestions of patient situations in which a physician may choose transfer, but not as a requirement for transfer under any circumstances.
4. The following co-morbid factors should also be considered in the decision for transfer:
  - a. Age greater than 55 years
  - b. Cardiac or Respiratory disease
  - c. Insulin-dependent diabetes, cirrhosis, morbid obesity
  - d. Pregnancy
  - e. Immunosuppression
  - f. Bleeding disorder or taking an anticoagulant

# High Risk Criteria for Consideration of Early Transfer

## Central Nervous System and Neck Injuries

### A. Head Injury

1. Penetrating injury or open fracture (with or without CSF leak)
2. Depressed skull fracture
3. Glasgow Coma Scale (GCS) less than 13
4. GCS deterioration
5. Lateralizing signs

### B. Spinal Injury

1. Suspected Spinal Cord Injury (with or without neurologic signs and/or symptoms)
2. Suspected Unstable Spinal Column (Fractures, Dislocations, Ligament Injuries)

### C. Penetrating injury to the Neck

## Chest/Abdomen

1. Major chest wall injury
2. Wide mediastinum or other signs suggesting great vessel injury
3. Cardiac injury
4. Patients who require 24 hours ventilation
5. Penetrating injury (not clearly superficial) to chest, trunk, abdomen or groin

## Pelvis

1. Unstable pelvic ring disruption
2. Unstable pelvic fracture with shock or evidence of continuing hemorrhage
3. Open pelvic fracture

## Major Extremity Injury

1. Fracture/dislocation with loss of distal pulses
2. Open long-bone fractures
3. Extremity ischemia
4. Amputations (excluding amputations of digits)

## Multiple-System Injury

1. Head injury combined with face, chest, abdominal, or pelvic injury
2. Major burns meeting American Burn Association Transfer Criteria
3. Other significant burns associated with major injuries or injury to the respiratory tract
4. Multiple long-bone fractures
5. Major injury to more than two body regions

### Secondary Deterioration (Late Sequelae)

1. Mechanical Ventilation required
2. Sepsis
3. Single or multiple organ system failure
4. Major Tissue Necrosis

### Further Pediatric Considerations

1. Hemodynamically stable children with documented visceral injury being considered for observational management
  2. Children with loss of consciousness > 10 minutes
  3. Infants and small children (often most vulnerable and frequently the least stable trauma victim)
  4. Children with injuries requiring complex or extensive reconstruction
  5. Children with polysystem trauma requiring organ system support.
-

# **Injury Prevention/Public Education**

**The consensus of this Subcommittee is represented in the following recommendations:**

1. The state is responsible for ensuring that there is at least one designated leader of injury prevention activity for each region.
2. Trauma Centers will assume leadership of injury prevention activity through the trauma facility designation process in accordance with ACS requirements.
3. The Injury Prevention/Public Education Subcommittee will provide trauma centers with a model and a “tool kit” to assist their efforts.

The attached documents include:

An Injury Prevention model for use by trauma facilities

The Subcommittee has not yet covered or finalized the following charges:

- Identify the key areas for educating the public and providers about the new Massachusetts trauma system and develop a strategy for carrying out an education plan
- Serve as an ongoing forum for discussion on injury prevention priorities and make recommendations for appropriate interventions
- Identify funding and resource needs to address injury prevention and public education initiatives
- Develop and implement strategies to build public awareness of the support and resources needed to maintain the state trauma system infrastructure.

## INJURY PREVENTION MODEL for TRAUMA and OTHER FACILITIES

COMPONENT	POINTS FOR CONSIDERATION
<p><b>1. Connection with the Mass. Department of Public Health (DPH) and the Mass. Fire Marshal's Office</b></p> <p>Trauma facilities are encouraged to take advantage of the data and programmatic assistance offered by the Fire Marshal's Office, the DPH Injury Prevention and Control Program (IPCP), the Injury Surveillance Program (ISP), and the Violence Prevention and Intervention Services Programs.</p>	<ul style="list-style-type: none"> <li>• DPH injury prevention program staff will be familiar with most projects underway in Massachusetts and other states regarding the prevention of unintentional and intentional injuries.</li> <li>• DPH will have access to data, including Trauma Registry data</li> <li>• They will have knowledge of which interventions have proved to be most effective in preventing different types of injuries.</li> <li>• The IPCP works in a number of areas, including child passenger safety, elder safety, poison control, bike safety, and suicide prevention.</li> <li>• The Violence Prevention Programs include Batters Intervention, Refugee and Immigrant Safety and Empowerment, Sexual Assault Prevention and Survivor Services, and Domestic Violence Prevention.</li> <li>• The State Fire Marshal's Office is active in many fire and burn prevention programs.</li> </ul> <p><i>Contacts from DPH and the Fire Marshal's Office can be found in Appendix A</i></p>
<p><b>2. Data</b></p> <p>Injury prevention initiatives should be data-driven.</p>	<ul style="list-style-type: none"> <li>• Use statewide data to get a larger perspective, as well as data specific to your community or target population.</li> <li>• If you are a designated trauma center, your hospital should have access to the data it submits to the State Trauma Registry on the nature and frequency of injuries and deaths from injuries treated in your ED and/or admitted.</li> <li>• If you are not a trauma center, can your facility provide any data on injuries?</li> <li>• State and local data can be obtained from DPH.</li> <li>• Useful data should include injury frequency and severity.</li> <li>• Try to obtain information on proven intervention effectiveness as you set your priorities.</li> <li>• Build data collection into your injury prevention project(s), so that you can evaluate the success of your efforts.</li> </ul> <p><i>See Appendix B for information on obtaining assistance in finding and using data.</i></p>



## INJURY PREVENTION MODEL (cont.)

COMPONENT	POINTS FOR CONSIDERATION
<p><b>3. Trauma Facility Networking</b></p> <p>The Massachusetts Trauma System is based on 4 levels of trauma facilities: Levels 1, 2, 3 and System Hospitals. The designation of trauma facilities will be based on the American College of Surgeons (ACS) verification process, which includes guidelines for injury prevention activity in addition to other aspects of care.</p> <p>As resources permit, trauma facilities at all levels should network with one another, so that resources and experience can be shared and maximized.</p>	<p>Networking among trauma facilities can be accomplished through:</p> <ul style="list-style-type: none"> <li>• Contractual agreements already in place among Massachusetts hospitals of all levels; and</li> <li>• Injury prevention collaboration between unaffiliated Systems Hospitals and levels 1, 2 or 3 trauma facilities.</li> </ul> <p><i>A suggested prioritizing of ACS injury prevention requirements can be found in Appendix C.</i></p>
<p><b>4. Selection of Priorities</b></p> <p>Injury prevention initiatives should be based on the identification of the community's short- and long-term priorities.</p>	<p>Your planning should begin with a <b>needs assessment</b> of your community. Setting priorities for action should include consideration of the following questions:</p> <ul style="list-style-type: none"> <li>• What is the nature of the particular injury problem?</li> <li>• Are there accessible data on the problem?</li> <li>• If there are no data on the problem, do you have an alternate strategy for setting priorities?</li> <li>• What are the characteristics of the population being injured?</li> <li>• What is the community's perception of the injury problem?</li> <li>• What resources can be used to address it?</li> <li>• What is the political climate for making needed changes?</li> <li>• Who are the people willing to collaborate on this with you?</li> </ul> <p><i>Suggested reading can be found in Appendix D.</i></p>

## INJURY PREVENTION MODEL (cont.)

COMPONENT	POINTS FOR CONSIDERATION
<p><b>5. Injury Prevention Framework</b></p> <p>Build your initiative(s) on an understanding of the 4 “Es” in the Injury Prevention Framework:</p> <ul style="list-style-type: none"> <li>• Engineering</li> <li>• Enactment/Enforcement of legislation and regulations</li> <li>• Education</li> <li>• Evaluation</li> </ul>	<p>Successful approaches to injury prevention often combine the 4 E’s. Child safety seats are a good example.</p> <ul style="list-style-type: none"> <li>• <u>Engineering</u>: The development of the child safety seat was the result of engineering and technology.</li> <li>• <u>Enactment and Enforcement of Legislation and Regulations</u>: Many states have laws requiring that children of certain ages be restrained in child safety seats. The success of the law and the rate of safety seat usage depend on the community’s ability to enforce the law</li> <li>• <u>Education</u>: The public must be educated on the purpose of safety seats, the law covering restraint of children in cars, and the proper use of the safety seat in the car.</li> <li>• <u>Evaluation</u>: What data have been collected on the effectiveness of safety seats, or what data can you collect that will show how your project has increased child safety seat usage? Sustainability of your efforts depends on your having objective results to present to your community and your source(s) of funding.</li> </ul> <p><i>Suggested reading can be found in Appendix E.</i></p>
<p><b>6. Collaboration</b></p> <p>Trauma facilities should include in their planning representatives from the community agencies that are involved in or concerned with injury prevention.</p>	<ul style="list-style-type: none"> <li>• Many organizations are involved in injury prevention activity, as well as groups interested in the health and safety of your target population. Some of them will want to work with you, depending on the project you select.</li> <li>• Through collaboration you can enhance your access to data and resources that will assist you in planning and carrying out your project.</li> <li>• Trauma patients and/or their family may be interested in collaborating with you.</li> </ul> <p><i>See Appendix F for information on organizations and contacts and coalition building.</i></p>

## INJURY PREVENTION MODEL (cont.)

COMPONENT	POINTS FOR CONSIDERATION
<p><b>7. Development of an Action Plan</b></p> <p>Trauma facilities should develop a plan of action that includes identification and securing of resources.</p>	<ul style="list-style-type: none"> <li>• Select feasible goals and objectives so that you can be successful in a reasonable period of time.</li> <li>• Identify a project coordinator.</li> <li>• Your interventions should be: <ul style="list-style-type: none"> <li>-Ongoing (as opposed to one-time, isolated efforts);</li> <li>-Sustainable (with adequate resources);</li> <li>-Supported by injury prevention/health education literature.</li> </ul> </li> </ul> <p><i>See Appendix G for further information.</i></p>
<p><b>8. Evaluation</b></p> <p>Build evaluation into your project from the very beginning.</p> <p>Once the project has been completed, an evaluation of its success or failure should lead to increased data, any needed changes in your collaboration partnerships, and the identification of future priorities.</p>	<ul style="list-style-type: none"> <li>• In times of scarce resources, project evaluation is an insurance policy for the continuation of your injury prevention efforts.</li> <li>• Distinguish between: <ul style="list-style-type: none"> <li>➤ “<u>process</u>” evaluation, which answers the question: Did we complete all the tasks in our action plan? and</li> <li>➤ “<u>outcome</u>” evaluation, which answers the question: Did our intervention reduce injuries or the effects of injuries?</li> </ul> </li> <li>• Evaluation facilitates program management: <ul style="list-style-type: none"> <li>➤ Is the program off track?</li> <li>➤ Do we need to make any changes?</li> </ul> </li> <li>• Be sure that evaluation costs are budgeted.</li> </ul> <p><i>See Appendix H for information on program evaluation.</i></p>

## A “TOOLKIT” of REFERENCES, RESOURCES and INFORMATION

### Appendix A: Connection with the Massachusetts Department of Public Health (DPH) and the Massachusetts Fire Marshal’s Office

Contacts: Cindy Rodgers  
Director, Injury Prevention and Control Program  
Tel. #: 617-624-5424  
Email: [cindy.rodgers@state.ma.us](mailto:cindy.rodgers@state.ma.us)

Victoria Ozonoff  
Director, Injury Surveillance Program  
Tel. #: 617-624-5663  
Email: [torie.ozonoff@state.ma.us](mailto:torie.ozonoff@state.ma.us)

Carlene Pavlos  
Director, Violence Prevention Programs and Intervention Services  
Tel. #: 617-624-5410  
Email: [carlene.pavlos@state.ma.us](mailto:carlene.pavlos@state.ma.us)

Jennifer Mieth  
Public Education Manager  
Mass. Fire Marshal’s Office  
Tel. #: 978-567-3381  
Email: [jennifer.mieth@state.ma.us](mailto:jennifer.mieth@state.ma.us)

### Appendix B: Obtaining and Using Data

For assistance in obtaining data on injury frequency and severity, statewide or by community, contact

- The Injury Surveillance Program in the Massachusetts Department of Public Health.

**Contacts:** Holly Hackman  
Tel. #: 617-624-5665  
Email: [holly.hackman@state.ma.us](mailto:holly.hackman@state.ma.us)

Beth Hume  
Tel. #: 617-624-5664  
Email: [beth.hume@state.ma.us](mailto:beth.hume@state.ma.us)

- The Massachusetts Trauma Registry

Your own hospital’s data can be accessed internally; other trauma registry data can be accessed through the Massachusetts Department of Public Health, Injury Surveillance Program.

## Appendix C: Trauma Facility Networking

The following is a suggested adaptation and prioritizing of the American College of Surgeons “Prevention” requirements for trauma facilities.\*

	<b>Level I</b>	<b>Level II</b>	<b>Level III</b>	<b>System Hospital</b>
1. Designate injury prevention coordinator-spokesperson that has been, or will be, trained in injury prevention and control.	<b>E</b> (full time)	<b>E</b>	<b>D</b>	–
2. Develop annual injury prevention plan based on local data, needs and available resources.	<b>E</b>	<b>E</b>	<b>E</b>	–
3. Coordinate and/or participate in community prevention activities.	<b>E</b>	<b>E</b>	<b>E</b>	<b>D</b>
4. Conduct outreach activities	<b>E</b>	<b>E</b>	<b>D</b>	<b>D</b>
5. Coordinate ongoing injury prevention coalition for region or catchment area.	<b>E</b>	<b>D</b>	<b>D</b>	<b>D</b>
6. Collaborate with other institutions.	<b>E</b>	<b>D</b>	<b>D</b>	<b>D</b>
7. Monitor progress and evaluate prevention programs; report on results.	<b>E</b>	<b>D</b>	<b>D</b>	<b>D</b>
8. Collaborate with existing state, regional and national programs.	<b>E</b>	<b>E</b>	<b>D</b>	–
9. Make information resources available to the public.	<b>E</b>	<b>E</b>	<b>D</b>	–
10. Conduct injury control studies.	<b>E</b>	<b>D</b>	–	–
11. Complete annual report of activities.	<b>E</b>	<b>E</b>	<b>D</b>	<b>D</b>

**E** = Essential; **D** = Desirable

\* *Resources for Optimal Care of the Injured Patient*, 1999, Committee on Trauma, American College of Surgeons, p. 102.

## Appendix D: Selection of Priorities

The National Committee for Injury Prevention and Control, *Injury Prevention: Meeting the Challenge*, Chapter 1 “Getting Started,” pp. 21-33. American Journal of Preventive Medicine, 1989

### Examples of Needs Assessment Tools:

- National SAFE KIDS community needs assessment: Contact the National SAFE KIDS Campaign, tel. 202-662-0600
- EMSC National Resource Center – Needs Assessment tool:  
[www.ems-c.org/ems/frameems.htm](http://www.ems-c.org/ems/frameems.htm)

## Appendix E: Injury Prevention Framework

Sources of information on approaches to injury prevention strategies include:

- 1) The National Committee for Injury Prevention and Control, *Injury prevention: Meeting the Challenge*, Introduction, “A History of Injury Prevention,” pp. 4-18. American Journal of Preventive Medicine, 1989
- 2) Baker SP, et al., *The Injury Fact Book*, Oxford University Press, 1992.

## Appendix F: Collaboration

### ➤ How can you find out who is doing what in injury prevention?

- 1) Directory of Injury Prevention Projects in Massachusetts: Massachusetts Yellow Pages, MA Dept of Public Health, February 2002

The *2002 Massachusetts Injury Prevention Yellow Pages - A Guide to Programs and Resources*, is a comprehensive directory of over 100 local, state, regional and national injury prevention programs. Each entry includes program name, address, contact information and a thorough description of the program. The purpose of the Yellow Pages is to help put programs in touch with one another and to help individuals identify available resources.

2) Community agencies and individuals, such as:

Community Hospitals  
Councils on Aging  
Elder Service Agencies  
EMS (your local ambulance service)  
Family Service Agencies  
Public Safety: Fire Service and Police [In many communities EMS is the responsibility of the Fire Service.]  
Local Boards of Health  
Local Mental Health Providers  
Primary Care Physicians  
Project Alliance – organized by the Middlesex District Attorney’s Office  
School Nurses, Parish Nurses, Visiting Nurses, Home Care Organizations  
Senior Centers  
Service Organizations, e.g. Kiwanis, Lions Club, Rotary  
**State Fire Marshall’s Office**  
WIC Programs

➤ How can you get the information you need on existing injury prevention projects?

Here is a suggested template for use in obtaining information on injury prevention programs.

## INVENTORY SURVEY

*[To be completed by the person getting information on the program from program staff.]*

Contact Person: \_\_\_\_\_

Organization \_\_\_\_\_

Tel. #: \_\_\_\_\_ Email Address: \_\_\_\_\_

1. Name of the injury prevention program:
2. What are the goals of the program?
3. Has the program been evaluated? Are the goals being achieved?
4. Did the evaluation result in any changes to the program?
5. How was the program activity selected?
6. Did they consult with injury prevention professionals?
7. Did they complete a needs assessment as part of the planning for this program?
8. Did they produce a report that you can get a copy of?

9. Where and when do their program activities take place?
10. Is the program ongoing or is it time-limited?
11. Who is the target population for this program? Why was this population chosen?
12. What materials did their program use? Did they determine whether the materials were culturally and linguistically relevant for their target population?
13. How did they determine whether the graphics were appropriate for their target population?
14. How is this program funded?
15. Can this program be replicated by other groups?
16. What data are gathered from this program?
17. With whom (groups, individuals) do they collaborate?

➤ **How can you build a coalition to carry out your project**

The National Committee for Injury Prevention and Control, *Injury Prevention: Meeting the Challenge*, Chapter 5 “Program Implementation,” pp. 97-101. American Journal of Preventive Medicine, 1989

## **Appendix G: Developing an Action Plan**

The National Committee for Injury Prevention and Control, *Injury Prevention: Meeting the Challenge*, Chapter 1 “Getting Started,” pp. 21-33, and Chapter 4 “Program Design and Evaluation,” pp. 64-74, American Journal of Preventive Medicine, 1989

## **Appendix H: Evaluating Your Efforts**

The National Committee for Injury Prevention and Control, *Injury Prevention: Meeting the Challenge*, Chapter 4 “Program Design and Evaluation,” pp. 77-86. American Journal of Preventive Medicine, 1989

*Demonstrating Your Program's Worth: A Primer on Evaluation for Programs to Prevent Unintentional Injury*, Centers for Disease Control, March 2000

## **Appendix I: Other Resources**

1. Allen, Kenneth, *Preventing Childhood Emergencies: A Guide to Developing Effective Injury Prevention Initiatives*, Washington, DC: Emergency Medical Services for Children National Resource Center, 1997.
2. The David and Lucile Packard Foundation, *The Future of Children: Unintentional Injuries in Childhood*, Vol. 10, No. 1, Spring/Summer 2000.



3. Christoffel, Tom; Gallagher, Susan S, *Injury Prevention and Public Health: Practical Knowledge, Skills and Strategies*, Aspen Publishers, Inc., February 1999
  4. Bonnie, Richard J. et al., editors, Institute of Medicine, *Reducing the Burden of Injury: Advancing Prevention & Treatment*, National Academy Press, January 1999.
  5. Widome, Mark D, *Injury Prevention & Control for Children & Youth*, American Academy of Pediatrics, 3<sup>rd</sup> ed., February 1998.
  6. Rivar, Frederick P. et al., editors, *Injury Control: A Guide to Research and Program Evaluation*, Cambridge University Press, 2001.
  7. Posner, Marc, *Preventing School Injuries: A Comprehensive Guide for School Administrators, Teachers, and Staff*, Rutgers University Press, 2000.
  8. *Injury Prevention*, a quarterly journal published by BMJ Publishing Group, [www.injuryprevention.com](http://www.injuryprevention.com).
  9. *CDC Injury Fact Book: 2001-2002*. This fact book offers a wealth of injury data and descriptions of CDC research and prevention programs for a full spectrum of injuries. This document can be viewed and downloaded from the CDC's National Center for Injury Prevention and Control's (NCIPC) web site at: [www.cdc.gov/ncipc/fact\\_book/factbook.htm](http://www.cdc.gov/ncipc/fact_book/factbook.htm). It can also be ordered online or by calling (770) 448-1506.
  9. Website for Injury Prevention Web: [www.injurypreventionweb.org/info/books/books.htm](http://www.injurypreventionweb.org/info/books/books.htm)
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